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Finance, Competition, Instability, and Development

Microfoundations and Financial Scaffolding of The Economy

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1. Introduction

“The money market is always, as it were, the headquarters of the capitalist system, from which orders go out to its individual divisions, and that which is debated and decided there is always in essence the settlements of plans for future development. All kinds of credit requirements come to this market; all kinds of economic projects are first brought into relation with one another, contend for their realization in it; all kinds of purchasing power, balances of every sort, flow to it to be sold.” (Schumpeter, 1934)

“We leave saving to the private investor, and we encourage him to place his savings mainly in titles to money. We leave the responsibility for setting production in motion to the business man, who is mainly influenced by the profits he expected to accrue to himself in terms of money. Those who are not in favour of drastic changes in the existing organization of society believe that these arrangements, being in accord with human nature, have great advantages. But they cannot work properly if the money, which they assume as a stable measuring-rod, is undependable. Unemployment, the precarious life of the worker, the disappointment of expectation, the sudden loss of savings, the excessive windfalls to individuals, the speculator, the profiteer—all proceed, in large measure, from the instability of the standard of value” (Keynes, 1936)

“The task confronting economics today may be characterized as a need to integrate Schumpeter’s vision of a resilient intertemporal capitalist process with Keynes’ hard insights into the fragility introduced into the capitalist accumulation process by some inescapable properties of capitalist financial structures ” (Minsky, 1986)

The financial sector has been viewed traditionally as either providing the “oil” for the “wheels of commerce” or as a parasite on the real sector of the economy where real productivity gains provide for increasing real wages and per capita incomes. However, the work of a series of writers in the tradition of the “knowledge and innovation” approach to the theory of the firm allows the analysis of financial institutions on a par with the production sector of the economy. The present paper will thus attempt to utilise “the knowledge-based” nature of firms’ operations as set out in the diverse theoretical frameworks of Schumpeter, Coase, Richardson, Penrose, Chandler and others to stress the importance of organisational and managerial techniques in the creation of market dominance by particular financial firms in the same way that these theories have analysed industrial firms¹.

¹ The increased interest in that “knowledge perspective” is explicit, for instance, in the two volume collection of essays in honour of Brian Loasby, where in some of the papers its “Smithian” origins is underlined and traced to the present through the works of John Rae, Marshall, Schumpeter and Young. (Cf. Dow and Earl, ed.: 1999). This same sort of concern is also being worked by Lündvall and his collaborators (Cf. Foray and Lündvall: 1996). None of them, however, addresses financial firms or financial activities.

The paper will also analyze the process of competition between different firms and between different financial structures in terms of the impact of different organisational regimes on profitability, efficiency, and instability of the economic system. This view of the operation of manufacturing and financial firms will then be linked with its *mesodynamic* counterpart first outlined in the work of Schumpeter, Minsky, and Vickers (cf. Schumpeter, 1934, 1939, 1942, Minsky, 1982, 1986, Vickers, 1968, 1987, Kregel, 1989-90) on the relationships between industrial competition, financial dynamics and competition in the financial sphere. Tracing the market dynamic of competition and market dominance based on the capture of knowledge-based advantages to its mesodynamic outcome produces a coherent explanation of *systemic instability* which amalgamates Knight-Keynes uncertainty, Schumpeterian financial leverage to exploit productivity enhancing innovations, and Minsky's tendency towards financial fragility and debt deflations. This analysis also leads to diverse policy recommendations concerning financial regulation, institution building, and micro-financial structure that are consistent with the other contributions to the "other Canon".

This "other Canon" has always stressed the importance of technological innovations based on the accretion of knowledge as the motor force driving economic development. Its "classical" roots have been recently resurrected in the work of Luigi Pasinetti. However, his work does not give the same importance to institutions and market forms as some other work in the field which suggest that certain economic activities and particular industries in particular historical periods lend themselves more readily to the absorption of knowledge-specific activities. Thus, in the tradition of Joseph Schumpeter and Alfred Eichner (Cf. Schumpeter, 1942 [1992]: chapters 7-8, Eichner, 1976: Introduction) "imperfect competition", viewed in the as the natural result of the competitive process, is a requirement for the generation of the technologically innovative activities required for growth and accumulation based on exploitation of this advantage through international exchange. Just as a single domestic producer seeks to exploit the advantages of technological dominance through market dominance, countries will seek to exploit their technological advantages through trade with other countries that is mutually advantageous, but seeks greater benefits by protecting their technological advantages (Cf. List, 1841 [1983] book II, Kaldor, 1967, Wade, 1990) .

2. Competition and the Dynamics of Manufacturing and Banking Firms

*"...The entrepreneur is the typical debtor in capitalist society"
(Schumpeter, 1934)*

"If innovations are possible, any long-term commitment to specific production techniques is uncertain" (Shackle, 1970)

*"Business has become terribly complex (and) survival is very uncertain in an environment filled with risk, the unexpected, and competition"
(Matsushita Konusuke, 1988)*

*"Both the evolutionary approach and the competence perspective are founded on a (Penrosian) notion of the firm as a knowledge-creating entity"
(N. Foss, 1996)*

The equivalence in the way manufacturing industry and financial services contribute to the creation of wealth in the economy is based on the assumption that financial services institutions operate in exactly the same way as industrial firms. Although there is a long tradition that views commercial banks as peculiar because they possess a special informational advantage relative to other types of financial institution or manufacturing firms, from the point of view of Chandler's analysis there seems to be no organisational advantage relating to the use of information that is peculiar to commercial banks compared to other financial institutions. The factor of knowledge absorption seems to be a general characteristic of successful business operation.

The traditional canon provides little help in the integration of financial institutions into the analysis of the activities of firms since, according to the work of Nobel Laureate Ronald Coase, it does not provide an explanation of the existence of firms. Coase's attempt to provide such an explanation thus serves as a useful starting point.

2.1. The Knowledge-Based Theory of Firm Organization: Capabilities, Strategic Management and Uncertainty

In his now famous 1937 article Ronald Coase jolted the traditional canon by pointing out that in a "large sphere in our economic system" the allocation of resources by relative prices determined in competitive markets which is the basis of the canon of traditional economic theory is superseded by the directed organisation of production within the firm. Thus the traditional canon had no application in this "large sphere" and had nothing to say about its operation.

In a retrospective consideration of his views (Cf . Williamson and Winter ed. 1991) Coase notes that little attention has been paid to this challenge to traditional theory and that economists seem to have lost sight of his "key idea: ... the comparison of the costs of coordinating the activities of factors

of production within the firm with the costs of bringing about the same result by market transactions" (Ibid., p. 65). He reiterates that the "basic reason" for the existence of firms is "the avoidance of the costs of contracting *between factors* of production" (Ibid., p.67, emphasis added), not the reduction of the costs of transactions "between the organisers of the firm and the factors of production it uses" (Ibid., p. 68) which might derive from long-term contracts which do not specify the particulars of the employee-employer relationship.

On this view, Coase appears to come close to the position of Chandler when he credits the success of business firms with more efficient organisation and management in bringing about the coordination of factors in complex processes of production. In Chandler's view managerial organisation itself is a technique of production that gives firms "first mover" advantages that allow them to introduce new production technologies and competitive domination in the markets for their products. To the extent that the disadvantages of arranging market contracts between factors arises from relative price instability that creates uncertainty, this view is also close to that which considers the firm a "pool of stability" that allows the long range planning, research and coordination necessary to launch new innovations (Cf. Coase, 1937 [1991], Chandler, 1990).

Chandler's work provides a chronicle of the ongoing struggle to be the first to achieve market advantage faced by firms operating in competitive markets. The history of this ongoing struggle depicts an operating environment in which continuous change and unforeseen circumstance is the most important feature threatening the survival of the firm. Chandler's archival work thus confirms Schumpeter's approach to capitalism as an historical process in which change, rather than equilibrium, is the most relevant feature. In contrast to the traditional canon, one of the factors that leads to the success of firms over other alternative organisations of production is the organisational efficiency exhibited by firms in dealing with the "change" and instability inherent in the economic system. Response to change may take place through the adaptation of the existing management and organisation of production or by change in the organisation itself (Cf. Best, 1990, Lazonick, 1991, and Chandler et alii, 1997).

The efficient organisational reaction to an uncertain environment is competition among firms who use creative innovations applying new ideas, methods, or resource combinations to survive by exploiting the opportunities of change.² But the very success of this competitive reaction acts to reinforce

² Although, as Nelson and Winter, Paul David, , and Brian Arthur, among other have stressed, not necessarily of "best practices" (cf. Nelson and Winter, 1982, David, 1985, Arthur, 1994) Indeed, within this context the idea of "best practice" may be without analytical content.

uncertainty and instability and calls forth new reactions and innovations leading to further self-perpetuating economic change in a growing dynamic system. However, these innovative competitive reactions have to be financed either by borrowing or by the issue of financial liabilities that can be honoured only if the innovations are successful in preserving the market position of the firm. Thus the inherent uncertainty faced by the firm in a competitive environment is extended to the financial assets held and traded by financial institutions and the public. Both finance and innovations thus function as twin “levers of riches” and as uncertainty creators. Their interplay is at the root of the capitalist system’s twin operating features: technical progress and conflict.³ (Schumpeter;1942 [1992] , Nelson and Winter;1982, Burlamaqui, 2000a).

Edith Penrose (Cf. 1959 [1995]) highlights the role of firms in creating an internal environment shielded from the instability generated by the costs of instability that Coase associates with market organisation. In an environment of competitive uncertainty, firms thus provide “pools of relative certainty” within which resources can be combined and coordinated in order to react to external volatility and generate endogenous innovation. Firms are thus not only more efficient in organising factors, they are more efficient in developing new techniques to cope with change in an uncertain environment. This approach is also compatible with Richardson’s insights on how the “development of capabilities” affects the “organization of industry” (Cf. Richardson; 1972, and 1998).⁴

If organisational structure is unique to each individual firm, then the inputs organised in a managed process of production in a firm also acquire specific heterogeneous and non-replicable characteristics determined by precisely how inputs are combined and coordinated (Cf. Penrose 1959 [1995]: chapters 3 and 5). As a consequence the value of inputs should not be considered the result of their intrinsic characteristics or their value on the market in alternative uses, but rather the result of the specific organisational and management structure in which they are employed. For this reason, inputs can never be perfectly substitutable and even if they are mobile, their use cannot lead to replication of particular production processes since they will possess acquired situational attributes that are firm specific. If the

³ A process wonderfully synthesized in Schumpeter’s celebrated phrase “creative destruction”.

⁴ Cf. Penrose :1959 [1995], Richardson, 1972 [1997],1998, and Winter, 1995. This approach is also known as the resource- based view of firms and corporate strategy (Cf. Wernerfelt, 1984, Montgomery and Wernerfelt, 1988, Prahalad and Hamel: 1990, Grant, 1991, and Foss ed; 1997). Extensions of this approach may be seen as providing the groundwork for the development of a “Schumpeterian” theory of the growth of firms. This theoretical bridge is in its infancy but can be perceived for instance in Best, 1990, Teece, Pisano and Shuen, 1992 , Montgomery ed: 1995 and Beckett, 1996, and Collis and Montgomery :1998.

resources are removed from one organization to another these acquired attributes will be lost or simply not relevant in a different context.⁵ It may thus be extremely difficult for competitors using different organisational structures to challenge the dominant position of a firm through replication of resources and a firm's position of dominance may be long-lasting at least until another dominant organisational structure is developed⁶.

2.2 Schumpeterian Competition, Resources and Rents

To emphasize the difference between the uniqueness of organisational structure and its dynamic ability of innovate, we can define the economic advantages gained by Chandlerian innovative "first-movers" as a result of creative destruction as "Schumpeterian rent", and the organisation specific value which is attributed to the acquired characteristics of inputs when organised within a particular firm as a form of "Ricardian rent".⁷ The two are inter-related in that the former is in principle bound to be dissipated by innovation diffusion, while the latter could be long lasting if organizational advantages can be protected from imitation. The innovations and innovative strategies that differentiate each firm from its competitors and create Schumpeterian rents will be protected from erosion by imitation only if attached to an effective protection of the organizational technique, while the "organization based" Ricardian rents will be preserved only if it is possible to keep differentiating the organizational structure more rapidly than competitors, who thus develop an "innovation dependence" on the market leader.

In such an environment firms compete to attain market advantages; success – or failure – in these strategies always results in asymmetries and conflict, some grow and/or strengthen their technological and organizational capabilities, while others disappear or are reduced to marginal activities

⁵ A good example may be found in the engineering departments of East German manufacturing firms. Cut off from replacement parts for their capital goods these departments eventually acquired the expertise to replicate every part of complex capital goods. However, after German unification and these State firms were privatised replacement parts were still unavailable, but they were not needed since the capital stock was so outdated that it was scrapped and replaced by new capital goods with readily available original replacement parts. The high skilled machine tool operators and engineers thus became redundant, their skills valueless and they were unemployed.

⁶ For a "Neo-Penrosian" perspective on firms and their strategic behaviour see Montgomery and Wernerfelt, 1988, Prahalad and Hamel 1990, Glaister, 1996 p 97, Beckett, 1996, and Foss (ed): 1996. For a recuperation and extension of Richardson's views on *capabilities* (he coined the concept), see Foss and Loasby ed. 1998.

⁷ The parallel here would be between the unique fertility of a piece of privately owned piece of land, and the unique degree of "organizational fertility" attained by the cultivation of the land by a particular farmer. The proviso here is that those resources or collections of resources applied by the farmer should be difficult to imitate (Winter, 1995). Examples are patents, locations, production processes, unique management, learning skills, and, most of all, core capabilities that are generally knowledge intensive and embedded in a high degree of tacit knowledge (Cf. Prahalad and Hamel, 1990, and Foss, ed, 1996 on capabilities, and Polanyi, 1967 on tacit knowledge)

in the economic system. Competition is therefore the struggle for survival and growth in a structurally uncertain environment (Cf. Nelson and Winter: 1982, parts 2 and 5). The objective is survival by means of the creation of barriers to protect market advantages from "invasion" by both known and potential (but not yet known) competitors; the strength of these barriers, aside from those based on political advantage, springs from successful first mover innovations in organisation of inputs in production. Above average profits are then just a consequence of the competitive advantages created by managerial and organisational strategies (Cf. Moss:1981, and the papers collected in both Rumelt, Schendel and Teece ed:1995, and Dosi, Teece and Chytry ed: 1998).

The profits that result from a dominant market position are always under threat from imitative strategies or innovative behavior of other firms and thus can only be maintained by means of a process of continuous product differentiation and productivity enhancement. The continuous competition for profit provides the dynamic connection among innovations, market structures and business and organisational strategies. Its major elements can be condensed into the Schumpeterian idea that new products and methods compete with old ones in changed conditions, which may mean death of the latter; and that "to escape being undersold, every firm is compelled to follow suit, to invest, and to accumulate" (cf. Schumpeter:1942 [1992] chapter 3:p. 32).

This means that competition occurs not only in existing markets among firms operating in the same sectors, but also among firms located in different sectors or industries and for "future markets" whose roots are already present only in the firms innovation strategies and technological expectations. Thus, competing firms are continually producing innovations and technical progress that permanently destroys existing entry barriers by creating new ones that are challenged in their turn. This implies a relation of cross-causality between innovation strategies and the reshaping of market structures and the competitive process as a "leapfrogging game" (Cf. Brenner: 1987, chapter 3).

We may sum up by quoting Schumpeter: "These revolutions periodically reshape the existing structure of industry [...] [constituting] this process of *recurrent rejuvenation of the productive apparatus*" (1992,p.68 emphasis added). Competition is thus conceived *not* as an adjustment mechanism (tending towards equilibrium) but as a powerful source of differentiation and efficiency promotion as well as a vehicle for uncertainty. Given these conditions [...] "A monopoly position is in general no cushion to sleep on". (Ibid. p.102). In a free market environment the existence of permanent change or "creative destruction" will produce a wide diversity of organisational techniques as firms seek the most efficient methods to provide for and select

the combination of material, financial and human resources with unique strategies and learning mechanisms.⁸ Instability, manifest in continuous fluctuations in economic activity, unemployment, bankruptcies and structural transformations is then an endogenous feature of the normal operation of competition in the economic system. Stability, therefore, is not an inherent propriety of the system, but the result of socially and institutionally constructed mechanisms designed to reduce or dampen instability (Cf. Minsky, 1990, Crotty, 1994, Burlamaqui, 1995, chapter 2) .

2.3. Production and Finance

The evolution of the competitive process described above also applies to the financial sector which is also capable of technological advance through application of scale economies and concentration through competition in activities capable of knowledge absorption. This helps to explain why Schumpeter considered finance as the motor force that allows firms to appropriate the resources necessary to introduce new technological innovations that change the competitive conditions in industry and that lead to the realisation of the gains due to scale economies (Cf. Schumpeter, 1934 [1997]), chapter 3, and 1939 vol 1, chapter 3)⁹.

Production and finance are intimately related by the financing of investment in new production technologies embodied in fixed and working capital; thus some of the benefits associated with concentration of production in knowledge-specific activities must be attributed to the financial industry and any argument made for protection to allow countries to develop particular branches of such industries should also include means to develop an appropriate national financial structure that allows the expansion of these knowledge absorbing sectors to take place (Cf. Christensen, 1992, Nelson ed, 1993). Thus, in the Schumpeterian view, finance plays the role of the handmaiden of creative destruction that allows industry to produce technological advance and economic development. Indeed, financial institutions

⁸ In such an environment, the competitive tendency to imitation and replication which should lead to equalisation of profit rates in fact produces permanent differentiation such that no proportionality law between investments and profits applies. Note that since they are all based on equilibrium as a natural state, equalization of the rate of profits is an almost "sacred" assumption of the orthodox canon, whether of the classical, Marxian, Neo-classical and neo-Ricardian variety.

⁹ Having said that, it seems also true - and somewhat paradoxical - that Schumpeter never really took time to discuss financial innovation or gave it a similar status in his theoretical framework. Although banks and finance were always at the center stage in his picture, neither product/process, nor organizational innovation in the financial sphere are treated analytically (Susan Strange has recently made a similar remark. Cf Strange: 1998, chapter 2) .After all, in Schumpeter's view, it appears that innovation had to be backed by finance, but finance itself was not usually served by innovation. This lacuna, it should be noticed, was fully inherited by the Neo-schumpeterian perspective. In the recently two volume set on "The Legacy of J. A. Schumpeter" collecting the most important articles published by Scholars working in that tradition, there is only one paper dealing directly with finance (cf. Hanusch ed: 2000).

will also be subject to the same conditions found in manufacturing industry, and driven by a competitive process based on entrepreneurial innovations in knowledge absorbing activities (Cf. Heertje ed: 1988)¹⁰.

In fact many of the characteristics that are attributed to specific types of industry as peculiar to the production of knowledge-based value-added are also present in the provision of financial services. For example, a now standard explanation of the existence of banks is based on the advantages of large scale operations. According to this approach banks acquire informational advantages concerning potential investment opportunities when they specialise in the investment of depositors' funds, they are thus more efficient than individual households in earning returns on the placement of savings. These scale advantages extend to increased efficiency in monitoring the performance of borrowers, and more recently to the process of financial engineering involving the unbundling of large indivisible investments for sale to households.

While this approach provides an example of the ways in which banks use informational advantages, scale economies and innovations, it is less convincing as an explanation of how banks differ from other financial institutions since this interpretation of the activities of banks differs little from those undertaken by money market mutual investment funds, with perhaps the sole exception that they offer transactions and transfer facilities to their clients and often provide price guarantees in terms of base money to depositors on the value of the lending to the bank (although even these are often offered by certain classes of money market funds, cf. Mayer, 1974). It would thus appear that the basis of the informational activities that provide advantages attributed to banks also characterise a much wider range of financial institutions that do not provide transactions services usually associated with the activities of banks.

Perhaps a better distinction would be one which separates those financial activities that are directly linked to the financing of production activities and those that are more concerned with simple exchange, or transactions in goods already produced, or legal title to the goods of the future provision of such goods. The distinction that we are trying to highlight here is not concerning the knowledge-base of the two activities; they are both knowledge-based. The distinction is that they rely on quite different types of knowledge about different types of activity. These two different types of knowledge-based activity may be seen in the different types of activity

¹⁰ This collection of essays is *the* exception in the Neo-Schumpeterian literature in recognising the crucial role of finance in Schumpeter's work (Although not trying to *integrate* finance into the inherited theory). Minsky on the other hand has repeatedly noted the affinity of Schumpeter and Keynes's view of finance (see, for instance, Minsky: 1986, p.113, and 1990).

engaged in by the archetypal commercial bank: credit creation through lending to business firms in support of productive economic activity that aims to increase total income and wealth, and the proprietary purchase and sale of financial assets to benefit from pricing differentials that occur at a point in time or over time with no impact on the absolute level of income.¹¹

Lending to finance production requires particular knowledge of the production process, costs, and future market conditions for the products produced by each firm to which credit is extended and thus of its prospects for repayment, and is generally linked to the role of banks as creators of credit providing access of firms to resources as set out by Schumpeter in his *Theory of Economic Development* (published in its first, German, edition in 1911). This is the sort of activity Hyman Minsky describes in discussions between the loan officer and borrower over the pro forma which tells the story of how the bank is going to be repaid. It is activity that relates to the bank's loan book.

On the other hand, the management of the bank's proprietary investment portfolio requires information about the formation and evolution of prices in current and future periods in various types of securities markets and may have no relation at all to the information required to make decision on lending to industrial borrowers. The motivation for such activity is, according to the theory of efficient markets, based on the ability of arbitrage in free competitive markets to eliminate any differences in the prices of identical titles to expected future income streams traded as financial assets. The successful arbitrageur profits from the elimination of such differences by being early to recognise them, while the successful borrower from the bank profits from the organisational or managerial innovations that grant the firm a dominant market position.

Despite this similarity it is the lending to finance innovative production activity that creates the high return, knowledge absorbing sectors that produce dynamic industrial growth (in the same vein, see Minsky: 1990; p 60-65). The impact of financial arbitrage is limited to the static efficiency of the competitive market process that forces uniformity in market prices and allocation of given resources to their highest return uses. These two types of knowledge-based activity carried out by most commercial banks when carried to extremes are reflected in the two basic organisational forms characteristic of financial institutions – relationship or house banking and competitive market-based activity known as “transactional” banking. In the former,

¹¹ In the financial sphere such trading may be beneficial to the extent that it provides liquidity in financial asset markets, but the contribution of proprietary trading is usually greatest when markets are buoyant and do not lack liquidity and least when markets are under pressure and traders are seeking liquidity.

the knowledge advantage possessed by the bank is of its clients' production activities and the potential profitability of these activities in producing the earnings necessary to pay debt service and repay principal on the credit advanced. This type of bank operation is usually associated with German Kreditbanks, but US investment banks have historically played a similar role, although in a slightly different context and on a reduced scale (cf. Madeleine, 1943, Robertson, 1955, 1964, Hammond, 1967). Indeed, German banks often employed engineers and scientists to help evaluate the technology and thus the long-term prospects of borrowers to fully exploit knowledge-based advantages.

It is characteristic of relationship banking that it does not permit of free market competition among banks for business since no firm would be willing to give up proprietary information required for a banking relationship to a financial institution if it thought the institution might be working for a competitor in the near future. For full information sharing between the bank and the borrower there must be an understanding of confidentiality in the treatment of information and thus of exclusivity in the services provided by the bank. Neither would a firm be willing to offer to a number of competing banks all the information necessary to allow them to make competitive bids for its business. On the other hand, financial arbitrage, which is the basis of most of the transactions activities of banks is based on knowledge of particular characteristics of the payment flows represented by financial assets and their prices prevailing in the market, or of the prices that other financial market participants expect to prevail at futures dates and places. Thus one might say that the relationship bank is speculating on the nominal profitability of an innovative industrial process embodied in the firm that it is financing, while in the second it is speculating on its ability to identify anomalies in the efficient operation of the market mechanism and the ability of market competition to eliminate them.

In this regard it is important to remember that although financial institutions have certain peculiar characteristics, usually linked to the regulatory environment in which they function, they are nonetheless business firms and will compete much like other firms. Thus, in the same way that the industrial structure is driven by competition, financial institutions will seek to earn profits from the exploitation and protection of their variously acquired knowledge-based advantages. That is, organisational and production advantages will produce dominant competitive positions which can only be challenged by firms that are capable of reproducing the new innovation, or perfecting another technique that is more profitable and more attractive to the market (cf. Burlamaqui and Lagrota, 1998, part 5).

As already mentioned, in financial systems where main banks or house banks provide relationship services, there is a tacit agreement, as well as a practical imperative, that banks do not compete for business. On the other hand, in market-based systems where the required knowledge does not cover information about clients, but about markets or instruments, these new financial innovations present the possibility of rapid reverse engineering and thus competitive emulation providing for eminently contestable markets; financial institutions will thus seek to replicate financial instruments and services offered to clients in order to compete for business.

This competition can take a number of forms, encompassing direct confrontation of competitors and the expansion of activities into other sectors or other areas of the production process. For example, the process Chandler (cf. 1990, 28 ff.) describes in which producers on reaching sufficiently large scale expand to provide the organisation of wholesale and retail distribution of their outputs, thus internalising external markets and eliminating the wholesale and retail distribution firms that organised them, has a counterpart in financial services. As the organisational ability of financial firms increases with the introduction of new information processing technology, increasing economies of both scale and scope, they tend to integrate additional services into their activities. There is thus an interaction between financial institutions and industrial firms in which banks and other financial institutions make it possible for firms to grow to the size at which they can realise economies of scale and scope, while the creation of financial firms capable of this activity requires the evolution and concentration of financial institutions and financial markets to a size that is sufficient to achieve similar economies of scale and scope¹².

In this regard Chandler's contrast of the diverse role of finance in the creation of railways in the US and Germany (See box) is instructive:

"The rapid rail growth of the late 1840s and 1850s created in both countries an unprecedented peacetime demand for capital. ...to nearly all the instruments and institutions of modern American corporate finance. ... In Germany, too, it encouraged the creation of a wholly new financial intermediary, one that became central to the later financing of large-scale industrial enterprise. This new type was the Kreditbank." (Cf. Chandler: 1990, 415).

¹² As yet, there is no equivalent to Chandler's monumental study of the comparative evolution of manufacturing firms for financial firms. However, the impact of these changes in the organisation of financial firms on the operation of financial market are set out in two books by Martin Mayer (Cf. 1988, 1992).

Chandler on Railway Financing in the US and Germany :

“In Britain and the US before the end of the 1890s, the first movers in the new industries rarely looked to established capital markets for funds. The initial capital that was not provided by an entrepreneur and his partners came from local investors, with some assistance from local financial institutions. In the US the first large-scale funding of industrial enterprises by investment banking houses and other financial institutions came only with the turn of the century merger movement. And this funding was used to rationalize production and distribution facilities and management organizations after the merger. Only in industries where such rationalizing permitted enterprises to exploit fully the economies of scale did the American financial institutions play a role in establishing modern industrial enterprises. In Germany, on the other hand, banks did play a significant role in providing capital for new ventures to entrepreneurs making the investment necessary to exploit the potential economies of scale and scope. In both Germany and the US the funds provided by the financiers brought them into the decision-making process as non-executive external members of the Board of Directors. Once the new consolidated enterprises in the US and the managerial enterprises in Germany were firmly established, the representatives of the financiers had less and less influence on decisions concerning current operations and the allocation of resources for future growth. Bankers preferred to remain bankers and to let industrialists run the enterprises. Moreover, retained earnings provided industrial managers with most of the funding needed to finance continuing growth.” (Chandler, 1990,597)

It is the legacy of J.P. Morgan’s activities in consolidating the railways that the railway bond became the dominant investment asset on the New York Stock Exchange until the 1914-18 war. Chandler attributes much of the difference in the financial institutions that financed the expansion of the railways in the two countries to the fact that German railways were nationalised by Bismarck, while in the US lack of government control and regulation produced rampant duplication and wasteful competition in the industry. This made the initial financing required to launch a railroad small, but required the intervention of investment banks to oversee the process of concentration and consolidation that ensured sufficient scale economies to generate profits.

It is also the case that innovation in the financial sector has been given the same protection traditionally practiced in industry to gain and protect national advantage. A good example is British policy to prevent the estab-

lishment of note-issue banking in the British North American colonies¹³.

As in industry, competition among individual financial institutions and national financial structures is generally based on technology producing the potential for achieving new economies in the production of financial services. We hear much today about the revolution in information technology due to the progress in communications and computing technology, but the introduction of the clipper ship on the North Atlantic routes, of the telegraph to bridge the Continental divide in the US, and finally the telephone were no less important in terms of their impact on the provision of financial services.

It thus seems clear that the arguments concerning the beneficial contribution to the commonweal of industry caused by its knowledge-based operations and by Schumpeterian competition also apply to the structure of the financial services industry that provides the financing for the introduction of new techniques by entrepreneurs in the industrial sector.

3. Banks, Organizational Capabilities and Financial Innovation

“Schumpeterian creation and destruction occurs in finance as well as in products and processes. The essential point of Schumpeter’s view of money and banks is that new combinations in production and in products could not appear without being financed: finance and development are in a symbiotic relation. Restricting the Schumpeterian vision to technology or even industrial organization misses the integrated character of Schumpeter’s vision” (Minsky, 1990)

¹³ The British government had already granted monopoly status to the Bank of England, who acted quickly to extend this monopoly privilege to the issue of bank notes thus ensuring a monopoly on this particular form of credit creation. The note-issuing banks formed in the British colonies in the pre-Revolutionary war period were a response to the extreme scarcity of means of payment and to provide clearing services for businessmen. In 1739 a note-issuing land bank was set up in Massachusetts, providing a transatlantic challenge to credit creation by the Bank of England. The British government declared the bank in contravention of the 1720 Bubble Act and when it was not closed a special act was passed by Parliament in 1741 to extend the application of the Bubble Act to the Colonies. As a result all the land bank’s outstanding notes were rendered legally null and void, to the embarrassment of the bank and its noteholders.

This did not, however, stop the creation of note-issuing banks and in 1751 Parliament passed an Act to outlaw such activities in Rhode Island, and another in 1764, to cover banks issuing notes in the rest of North America outside the original British colonies. Parliament passed additional legislation to forbid any issue of notes and bills and their use as legal tender money. This additional legislation created much resentment in the colonies for, as in the case of the land bank, it was considered an ex post facto application of British legislation which had been formulated without the consultation or representation of British subjects in the Colonies. It also meant that the colonies remained totally dependent on Britain for means of payment and financial services, greatly impeding the economic development of the colonies. This legislation was certainly as influential as the more famous Stamp Act in provoking the rebellion against the British Parliament’s power to legislate over British subjects in the colonies without allowing them representation in Parliament. Paradoxically but understandably, after Independence, many of the States incorporated the Parliamentary restrictions on note issue into their own legislation in order to prevent individuals from issuing notes. Massachusetts went so far as to incorporate the Bubble Act fully in its legislation” (Cf. Kregel, 1996).

In Hyman Minsky's view "A banker is always trying to find new ways to lend, new customers, and new ways of acquiring funds, that is, to borrow; in other words, *he is under pressure to innovate*". (Minsky, 1986, emphasis added). This description of banking activity seems very similar to the action of business firms described in the previous section. Indeed, banks have long been analysed as business firms, but the knowledge and innovation aspects highlighted in the approach of Coase Schumpeter, Chandler, Penrose and others who have sought to build on the organisational advantages of firms relative to market organisations do not seem to have been applied.

As noted earlier, one of the standard explanations of the existence of banks relies on the superior knowledge they acquire concerning investment opportunities not available to individual households seeking long-term outlets for savings, but this aspect of the operation of commercial banks hardly seems to distinguish them from other types of financial service provider or indeed from manufacturing firms. In this respect it is interesting to note that both Ford and General Electric have been leaders in particular sectors of non-bank financial services and have generally applied the same business principles to their production and finance enterprises. It thus seems reasonable to treat both manufacturing and financial firms, including banks, through the same approach, exception taken for the differing degrees of government regulation. The common ground applicable to both is the importance of knowledge absorption as the basis of their activities aimed at ensuring market dominance in an uncertain and unstable economic environment.

3.1. Banks, Finance and Liquidity

As already mentioned, there are two aspects to the discussion of financial firms which should be distinguished, both for analytical and for policy reasons. The first aspect involves the crucial role played by financial firms in providing manufacturing firms the credit required to engage in the competitive process of creative destruction. The second is the evolution of financial markets as a result of the competitive behavior of financial firms themselves and the impact that this has on the ability of business firms to finance new innovations.

The first aspect exemplifies Schumpeter's industrial or "Kreditbank" ideal type of finance¹⁴, and incorporates Minsky's financial fragility framework in which the interaction of business and financial firms adds an additional dimension of uncertainty and instability to the analysis of the conditions of continuous change faced by manufacturing firms. The second aspect still remains to be fully explored, but will blend Schumpeterian competition in

¹⁴ This approach is shared by authors as diverse as Hilferding and members of the pre-monetarist Chicago school such as Henry Simons, Lloyd Mints and Jacob Viner.

organizational capabilities through creative destruction with an extension of Minsky's insights into financial innovation, in order to analyze competition in the financial sector. This second topic will be rather different than the analysis of the competitive process in the industrial sector due to the dominant role played by government regulation of financial institutions and the limits that this sets on the ways in which they may exercise competitive innovations.

Minsky's work belongs to the Post-Keynesian approach to economics, a school, which takes money and finance (rather than technology or innovation *per se*) as the most important features of the organization of a capitalist system, and that emphasizes the crucial importance of the concepts of uncertainty and liquidity preference to understand both the multiple rationalities and the volatility that guide investment decisions, as well as their implications for economic instability. Minsky's approach emphasizes the need to fully incorporate *real world phenomena* - and specially finance - into the core of economic analysis, in order to be able to grasp the *intrinsically unstable* nature of capitalist economies.

According to Minsky, modern capitalism could only be understood by adopting the viewpoint of what he named "The Wall Street Paradigm": "Looking at the economy from a Wall Street board room, we see a paper world - a world of commitments to pay cash today and in the future. These cash flows are a legacy of past contracts in which money today was exchanged for money in the future. In addition, we see deals being made in which commitments to pay cash in the future are exchanged for cash today. The viability of this paper world rests upon the cash flows (or gross profits after out-of-pocket costs and taxes) that business organizations, households, and governmental bodies receive as a result of the income-generating process" (Minsky, 1982, chapter 3, p. 63).

However, in his *vision*, understanding money means understanding a vital process shaping social evolution whose future course remains open-ended and contingent. In this sense, Minsky's theory should be taken as an essentially institutionalist one, in the sense that he viewed the structure of the economic world - much like his former teacher Schumpeter did - not as immanent in some set of underlying data - such as endowments or technology - but rather as constituted by a set of key economic institutions. Money was one of them, in fact the most important of them. His way of fleshing out that idea was to look at every economic unit - firms, households, governments and even countries - as though it were a bank daily balancing cash inflow generated by a stock of assets against cash outflows required to maintain the liabilities that were created in order to acquire those assets (cf. Mehrling: 1998,15-16). From that point of view, categories such as production, consumption, trade and investment first of all represents

exchanges of stocks of real and financial assets which have particular monetary flow characteristics and conditions attached to them. To put it bluntly, money and finance are *the most real aspects of capitalism*, the ones from everything else springs¹⁵.

In the logic of finance the most basic element of the economy is cash flow, and the most basic constraint on the behavior of the economy is the “survival constraint” which requires that cash outflow not exceed cash inflow (cf. Minsky: 1967, 157) if existing stock positions are to be maintained. Because the exact coordination of payments is impossible, even this simple constraint involves finance. From that perspective, finance and financial relationships are fundamental because they *oxygenate* economic units, allowing them to purchase without previous savings, and they make growth and structural transformation possible, by providing current purchasing power to those who would use it to expand the boundaries of the system.

However, in Minsky’s thinking, finance has a double-edge quality. The other side of the above mentioned “positive” roles, is that finance allows economic units to become illiquid in the present (by way of cash commitments) in exchange for the *possibility* of recovering liquidity (plus profitability) in the future (through the acquisition of assets whose expected cash-flows will exceed the cash commitments entered into to acquire them). Thus finance allows future commitments to be undertaken which may turn out to be impossible to fulfill. The failure of expectations to be realised will then take the form of liquidity crunches, or in worst case outcomes of insolvencies and bankruptcies.

Subjectivity and volatility of expectations thus make financial asset prices more volatile than prices in other parts of the economy (Cf. Keynes: 1936 [1983] chapter 12, Strange: 1998). Secondly, given the inherent volatility of financial asset values, liquidity provides an important “protective device” or “defensive strategy” to manage uncertainty. This is for two reasons. The first is that since money is the unit of account its value is less volatile and more certain in terms of other goods than other financial assets; it thus represents a refuge from price volatility. Secondly, it provides assurance that future cash commitments can be met with certainty. Thus firms may want to hold cash cushions to make sure that they can meet recurrent cash commitments when their income flows are subject to fluctuations. This is the basis of Minsky’s theory of financial fragility (1990: p. 6): “The liquidity preference schema of Keynes transformed economics into a study of inter temporal relations: not only is the future now but the past is also now. After

¹⁵ In the words of Mehring (1998: 16): “The veil of money is the very fabric of the modern economy”.

Keynes, there was no reason to do economic theory that was presumably relevant for a Capitalist economy without examining the relations in production, consumption and finance that link yesterdays, today and tomorrows".

Commercial banks face a series of risks, the most important being liquidity or funding risks. Commercial banks fund their lending by borrowing from the public through the issue of sight deposits which may be redeemed at any time. If the bank has lent these funds to a commercial borrower it will have to attract alternative lenders in order to avoid calling in loans. It may not always be able to do so, and the fact that it may at times lack the liquidity to repay liabilities and is unable to refund the lending by finding other depositors is its liquidity or refunding risk. If the commercial bank is lending to business it also faces credit risk, for the firms that have borrowed from the bank may not be able to repay on a timely basis (i.e. they may have become speculative finance units). The bank would then itself become the equivalent of a speculative unit and face difficulty attracting additional deposits as questions were raised about its ability to repay deposits. Finally, if the bank has issued liabilities, on which it has made a commitment to pay interest, to fund lending at interest, it must make sure that the positive differential, or net interest margin, between the rate on its liabilities and the rate on its assets is maintained. If the term or the reset rate of the interest on the liabilities is shorter than that of the assets, the bank faces market or interest rate risk. Should the rate it has to pay to attract funds rise above the rate at which it has committed to lend, then a loan is subject to net present value reversal and the bank will make losses and be unable to meet its commitments.

It is thus extremely important for a bank to present itself to its depositors as a hedge financing unit that is able to make payments to its creditors on demand with perfect certainty. This would seem to imply holding a cash cushion against potential deposit withdrawals of 100% of the deposits, and this would imply that the bank could do no lending (which is clearly not the type of bank Schumpeter had in mind). If a bank does no lending, and does not acquire any other assets, its earnings would be determined by the charges that it makes to depositors for holding funds in safekeeping and providing payment and transfer services.

However, commercial banks do make business loans, so the question is how it does this without incurring unmanageable risks. The term "unmanageable" is very important here – it means without running the risk of becoming a speculative unit and being unable to meet depositors requests for withdrawal of funds. Thus, although banks will incur both liquidity and credit risks, they seek to make them manageable by fully hedging these risks (Cf. Kregel 1998 d, ch. 7).

We may see how this might be done by taking an ideal type commercial bank that only makes short-term commercial and industrial loans of less than 90 days that are over fully collateralised (i.e. the value of the loan is some fraction of the anticipated realisation value of the collateral) against goods in warehouse or contracts for sale of outputs. Thus, if a borrower fails to repay, the bank takes possession of the goods and sells them for a value that should be approximately equal to the amount of the loan if the loan officer has properly valued the collateral. Loan should thus be less than 100 per cent of the total value of the property pledged as collateral.

By making payments services available to its depositors banks also insured that "deposit drain", that is, the redemption of deposits, was reduced since depositors withdrawing funds to make payments to other depositors in the bank would require only a transfer from one account to another, without the bank ever needing liquidity to make the payments. Bankers can calculate with a reasonable degree of certainty (as reasonable as the mortality tables used by insurance companies to predict life policy payouts) the amount of their total deposits that would "die" and have to be repaid in the course of any given day. At the same time, the bank can arrange the temporal distribution of its lending so that approximately the same proportion of total loans were repaid each day as the cash turnover requirement. Incoming loan repayments would thus roughly match maturing payments, minimising the amount of cash that has to be available to meet cash outflows.

Since these calculations are only statistical probabilities, they have a margin of error which is represented by daily variations in these flows above and below the statistical estimates. Thus bankers have found that on frequent occasion they may be required to meet net outflows of funds and a cash cushion or liquidity reserve needed to be held to meet this contingency. Usually this reserve against deposits has averaged much less than 10%. In the case that the value of collateral failed to cover the value of a loan, the bank's owners would have to use their pledged capital (which was usually invested and thus also of lower realisation value than the balance sheet value of the equity) or call as yet unpaid capital, which could also be used to meet payments to depositors. Thus, for average daily operations a bank could "safely" lend a relatively large multiple of its capital and of its deposits, with its risks fully hedged by the value of the collateral, its cash reserve cushion and the bank owner's capital. As a result, banks are usually very highly leveraged, with gearing and deposit multipliers well in excess of 10 to 1, without being considered excessively risky. In this way a bank could maintain a risky, but hedged balance sheet that would protect it from the occasional encounter with "speculative" conditions in Minsky's sense.

However, hedging the risks of a highly leveraged balance sheet does have costs in the form of opportunity costs since a main source of earnings for the bank will be the difference between interest on loans and the costs of funds and the multiple by which the bank can create deposits by lending in excess of the amount of its borrowing from the public in the form of deposits. To increase this ratio beyond that associated with hedging of risk means increasing the probability that the liquidity and capital cushion will be insufficient to meet repayment requests and a liquidity crisis and a loss of confidence which would soon produce insolvency and demands for repayment that exceed reserves and capital resources. Thus banks also face a trade-off between risk, and liquidity which translates into a tradeoff between profitability and liquidity.

Notice that the decision on how to hedge the various risks depends on the subjective perception of these different risks and the values of the collateral pledged against loans; the type and degree of hedging will thus be representative of the bank's liquidity preference. A decision to expand credit lending through additional deposit creation, other things being equal, is thus a decision by the bank to reduce its liquidity cushion and either an explicit decision to increase risk, or a *subjective* revaluation of the bank's position that reduces the perceived risks faced by the bank or increases the collateral values pledged against loans. For example, a more optimistic evaluation of the resale value of collateral will allow a bank to increase its lending without increasing its perceived risk. However, this depends on the reliability of the new estimate of collateral value. For example, Japanese banks generally grant loans on the basis of collateral valuation. As the property market boomed after the Louvre Agreement in 1987 led the Japanese authorities to reduce interest rates, Japanese banks either lent to or created their own property companies, increasing their exposure *pari passu* with the rise in prices which were being driven up by the increased demand for property caused by the purchases of the property companies. Since many of these companies were quoted on the stock exchange, the increased lending to property companies fueled a rise in their stock market value and the creation of investment companies which qualified for bank lending because of the rise in the stock market value of the property companies. A vicious circle was thus created in which the banks fueled both a property and a stock market boom without increasing what appeared to be fully hedged and thus manageable risks. When interest rates were increased and the markets turned in 1989, the banks' exposures could not be reduced to restore collateral coverage to acceptable levels and the loans effectively became valueless.

3.2. Schumpeterian Competition and Financial Instability

From a Schumpeterian point of view, competition in the financial sphere should include the same forces of creative destruction implemented by means of innovation, including innovation in organizational capabilities. The institutional embeddedness of the whole process should also be acknowledged, namely the dominant role played by government in the regulation of financial institutions, and therefore, the crucial part played by policy measures.

Although financial institutions are driven by the same general motives and objectives, there are some important similarities between financial and industrial firms and the markets in which they operate. Just as the manufacture of physical goods, requiring physical productive activity and time, relies on the present commitment of resources which will produce outputs to be sold under uncertain expectations of future market conditions, financial markets create contractual commitments in the present which involve future payment commitments which will take place in uncertain future conditions.

In general, the prices at which physical outputs will be sold are only determined at the time of sale, while the prices at which financial contracts can be sold at future dates are determined in the present and must confront uncertain actual future prices. Since little if any reliable information exists in either case concerning the conditions that will prevail at future points in time, expectations of profit or loss cannot be based on objective factors since these objective conditions will only be produced by decisions which are yet to be taken. The result will be expectations that are subject to extremely volatile revisions over time, driven by both relevant and irrelevant information, leading to substantial price instability. However, since production decisions take more time and effort to adjust to changes in conditions than financial contracts the revisions of decisions and thus the volatility of prices will tend to be greater for financial contracts than for production decisions. (Cf. Shackle, 1972 [1992], books III and VI, and Vickers, 1994).

But there are also important differences. For example, when financial institutions are competing aggressively they seek to maximise their market share, but when they are faced with difficulties they restrict their market expansion and compete for liquidity and/or, for solvency. As a result, competition in banking carried an inbuilt tendency to underestimate risks when the economy is expanding at a steady and seemingly predictable pace, and to overestimate them when the economy is in decline. It is the former that is more dangerous for the survival of the bank and is the additional source of uncertainty and instability to that created by the competitive activity of firms discussed above. In the United States, a process of banking compe-

tition conforming to the characteristics suggested above culminated in the stock market crisis of 1929 and the banking crisis of 1933 when a majority of US banks became insolvent due to a liquidity crisis that turned into insolvency, much as described in Minsky's theory. Regulations were then introduced which attempted to institutionalise the commercial bank and to limit its operation in financial markets to transactions services and short-term commercial lending, based on an application of the real bills doctrine (Cf. Kregel, 1996, Chapter 5).

For example, most countries have introduced formal regulations that impose bank hedging through uniform standards for bank liquidity in the form of compulsory reserve ratios and minimum capital ratios. Further, central banks in some countries have accepted the responsibility of acting as lender of last resort to provide emergency funding by advancing credits against a bank's doubtful assets thereby allowing it to meet payment commitments even when it is in a speculative position and cash flows do not provide sufficient liquidity to meet depositor withdrawals. However, the provision of refinancing by the central bank is not provided costlessly, and is usually provided in exchange for banks accepting the application of compulsory reserve and capital ratios and is also made available at above market interest rates that sharply reduce bank profits and represents an effective way for the Central Bank to limit credit expansion by reducing the profitability of increasing lending and thus its attractiveness to banks.

However, even government legislation to impose hedging on commercial banks in the form of regulation could not protect commercial banks from change and innovation as they faced competition from providers of financial services and to protect their market share they soon started to branch out into term lending while competing financial institutions sought to provide transactions account to their clients in direct competition with commercial banks. A competitive struggle thus took place between financial institutions facing different types of financial regulation. But, these regulations limited competition and innovation to the detriment of commercial banks and they became subject to loss of business to financial institutions that were not so highly regulated. Much of their traditional lending to corporate borrowers thus passed to more efficient forms of organisation, such as commercial paper and money market mutual funds. This has meant that what was once a bank's most important source of earnings, the net interest margin between borrowing and lending rates and the size of its deposit multiplier, has been declining dramatically. To meet this shortfall in earnings commercial banks have been forced into other areas of activity, such as the provision of financial services to generate fee and commission income, and to increase the use of their proprietary trading in financial assets (Cf . Kregel, 1996, 1998).

As noted above, proprietary trading by commercial banks requires a totally different type of information, present and expected prices of financial assets and the conditions of their payment streams, to generate profits from financial arbitrage. In this activity earnings are based on knowledge of prices prevailing in the market, or of the prices that other financial market participants expect to prevail. Thus one might say that it is a type of speculation on the efficiency of the operation of competitive forces in the market to eliminate pricing anomalies.

The reason that commercial banks have had to expand their activities in new directions is that the government regulations impeded their ability to use financial innovation to expand net interest margins on their normal lending activity. In the United States in the 1970s savings and loan institutions started to compete with banks for transactions deposits by offering transactions accounts that paid interest plus a free toaster or mink coat depending on the size of the deposit while commercial banks remained restricted to zero interest deposit accounts. Thus, innovation by banks has been primarily in the form of counter-regulatory innovation. Since regulations apply to reserve ratios and interest rates payable on deposit funds, innovation by banks has involved seeking new sources of deposit funds that are not technically classified as deposits and this was the primary source of competitive innovation in the 1970s and early 1980s (Cf. Mayer, 1974). Since the introduction of capital ratios applied to risk weighted assets, innovation has involved creating new types of assets that have lower risk weightings or do not appear on bank balance sheets at all and thus do not require capital at all. The result has been a rash of new product innovation in which banks act as market makers in derivatives products.

Another competitive response to regulation was to shift activities abroad where domestic regulations do not apply. The credit crunch and regulations on capital flows introduced in the US during balance of payments and dollar crises in the 1960s created incentives for US banks to shift some of their borrowing operations out of the United States to "off shore" markets, primarily London. In addition to providing new sources of dollar funding for US banks, they provided an environment free of the segmentation imposed by US bank regulation. Commercial banks could thus operate internationally much like investment banks in the US, making many US bank global players, dealing in financial assets from around the globe.

These new activities undertaken by banks represent substantially different types of risk and different tradeoffs between risks and returns. Thus, banks have in general been forced to change their activities in order to defend their earnings and this has in all probability been associated with an increase in risk. An average US commercial bank now generates roughly one third of

earnings from lending on net interest margin, a third from its proprietary trading portfolio and a third from fee and commission income. The latter is especially important because it carries a zero capital charge and virtually no liquidity or credit risk. Proprietary trading, on the other hand, carries large price risks which banks have not traditionally been accustomed to manage (Cf. Strange: 1998, chapter 2).

Finally, much of bank lending is now being securitised into collateralised loan obligations which the bank sells to final investors in order to move loans off their balance sheets. This not only frees up bank capital, it also generate fee and commission income from booking the loans and underwriting and sales of the securitised packages which requires no capital allocation. Lending to firms is being done increasingly through derivative packages arranged by banks and sold to bank clients, often with the bank itself taking the opposite side of the hedges or providing subsidiary guarantees that also appear as off balance sheet entries. Thus, the package of risks undertaken by banks is changing rapidly as they innovate to enter new activities to protect earnings, making it much more difficult to identify the appropriate "margins of safety". Further, much of the innovation involving derivative contracts involves shifting risks. It is usually argued that this process shifts risks to those who are most willing to bear them. But since these contracts often make it more difficult to identify the true risk of an instrument they do not always shift risks to those most able to bear them, producing another type of instability into the system of Schumpeterian competitive innovation.

3.3. Schumpeterian Competition, Derivative Contracts and Financial Fragility

Banks also offer derivative contracts to their clients in what is termed the "over-the-counter" (OTC) market. But, there is no regulated "market" involved in these contracts which consist of highly complex combinations of standard futures and options contracts stipulated on a bilateral basis to meet the particular needs of clients. As already noted, the incentive to offer these contracts arises from the fact that they do not involve direct lending by banks to clients and since they often are executed through specialised investment firms that are independently capitalised, they have the advantage under the Basle capital adequacy requirements, of requiring little or no capital, or of being classified as off-balance sheet items because they do not represent a direct risk exposure for the bank. In addition, they generate substantial fee and commission income. Rather than committing capital, the banks are simply intermediaries whose services involve not only matching borrowers and lenders, but acting as market innovators creating investment vehicles that attract lenders and borrowers. Nonetheless, these activities often require banks to accept some of the risks associated with the deriv-

atives created to produce packages with the characteristics desired by final borrowers and lenders.¹⁶

The major objective of active, global financial institutions is thus no longer the maximisation of profits by seeking the lowest cost funds and channeling them to the highest risk-adjusted return, but rather in maximising the amount of funds intermediated in order to maximise fees and commissions, thereby maximising the rate of return on bank capital. This means a shift from continuous risk assessment and risk monitoring of funded investment projects that produce recurring flows of interest payments over time, to the identification of riskless "trades" that produce large, single payments, with as much of the residual risks as possible carried by the purchasers of the derivatives package. As a result, the efficient international allocation of investment funds to the highest risk-adjusted rate of return depends increasingly on assessment of risks and returns by the lender. Yet, it is the role of most derivative packages to mask the actual risk involved in an investment, and to increase the difficulty in assessing the final return on funds provided.¹⁷ As a result, certain types of derivatives may increase the difficulties faced by private capital markets in effectuating the efficient transfer of risks to those best able to bear them. By extension, if they make investment evaluation more difficult for primary lenders, they may also create difficulties for financial market regulators and supervisors.

An example of how the risk characteristics of an asset may be clouded by the complexity of its structures would be a US government agency dollar denominated structured notes with the interest payment, or the principal value, linked to an index representing some foreign asset. The return to these notes would be higher than US domestic rates, but the increased yield would be accompanied by the increased risk due to foreign exchange exposure. Such an asset might be a one-year dollar-denominated note paying a guaranteed above-market interest rate, but with the amount of repayment of principal linked to an index, say the Thai baht/dollar exchange rate. Since the asset is denominated in US dollars, and the interest is guaranteed and paid in US dollars, the notes carry an investment grade credit rating and would be entered on the balance sheets of investors as the equivalent of a US Treasury or Agency security, not as a foreign investment subject to foreign exchange or country risks.

¹⁶ These derivative risks may or may not be hedged by the bank, depending on its own proprietary investment strategy. When hedging does occur it can be done either by physical hedging (i.e. the actual purchase of an offsetting position in the underlying financial asset), through the purchase of derivative contracts in organised markets, or by producing a package which involves risks which offset those involved in other packages (cross hedging or risk matching across clients).

¹⁷ For example, Chew (1996, p. 57) observes that "Structured notes are the epitome of how investment technology helped and continues to help money managers circumvent guidelines that were framed to protect the interest of small, unsophisticated investors."

The above-market return could be created by lending the principal sum (less the amount required to buy a one-year Treasury bill which will provide the guaranteed dollar interest payment at the maturity of the contract) directly to a Thai bank by buying a bank acceptance. If the baht/\$ exchange rate remains constant the Thai baht interest and principal repayment can be converted at maturity to a dollar value equal to the original investment of principal, leaving an excess over the US rate equal to the differential between Thai and US interest rates. However, if the baht devalues relative to the dollar, then the dollar amount available to repay will fall below the original investment. The buyer thus has the entire principal at risk related to the baht/\$ interest rate, and only the interest is guaranteed. The contract arranged in this way would provide Thai banks with below market rate funds, provide US investors with above market returns (eagerly sought because US rates were in decline from 1991 to 1993) and the banks with fees and commissions for arranging the trade, but with no commitment of capital (most US banks were emerging from the experiences of the real estate crisis of the 1980s and were seeking to rebuild capital).

It is virtually impossible for the US investor to evaluate the use of the funds made by the Thai bank, and there is little incentive for the US bank to do so, since once the structured note issue is sold, the foreign credit and foreign exchange risks are borne by the US investor. The investor is not only subverting prudential controls (on its balance sheet these assets would be classified as exposure to a US entity, with investment grade credit risk), but is in all probability evaluating the return without any adjustment for the foreign exchange risk, even if that risk is recognized as such. There is thus little economic interest or possibility for the market to either assess the risk or the returns of the investment and thus there can be no guarantee that these risks are being borne by those most willing and able to bear them.

Regulation has thus meant that the major form of Schumpeterian competition in financial sectors has been competitive innovation *against* different regulatory classes of financial institutions (e.g. savings and loans versus commercial banks, commercial banks versus investment banks). This activity has been concentrated on innovations in creating sight liabilities that were exempt from required reserve in the 1970s and in innovations to create assets that had reduced risk weighted capital requirements in the 1990s. But, within each regulatory class, the competitive pressure is extreme since the products that a bank uses to decrease its required reserves or regulatory capital in order to increase its earnings are easily replicated through reverse engineering, being based on techniques that are gen-

erally known in the markets and are sold publicly to clients.¹⁸ Financial product innovation diffusion occurs almost instantaneously, since patent protection is difficult to attain and information is rapidly diffused (by product imitation) among institutions.

So, on Schumpeterian terms the profits from being a first mover are ephemeral and difficult to monopolise –once created, they almost instantaneously evaporate through imitation (Cf. Burlamaqui and Lagrota, 1998, part 5, Burlamaqui 2000 b, pp 12-19). Therefore, continuous product innovation is required for banks to create surplus profits, conquer new clients, and improve competitive position against other banks. But since it cannot protect these gains the major movement in competitive innovation has been a process of rapid bank consolidation as it is easier to buy competitors than to gain a dominant advantage over them, hoping in the process to expand on the basis of economies of scale and scope. This is occurring both within regulatory classes, with the creation of large regional bank groups, and across classes as banks seek to defend themselves from competition from other regulatory classes by forming groups that cut across regulatory lines. The result has been that finally in 1999 US banking legislation has been approved that removes the regulatory classification that has driven much of the competitive activity in the financial sector over the last thirty years, opening the way for consolidation across different product lines or banking functions.

It should be clear by now that innovative strategies in the banking system play a crucial role in shaping and re-shaping its tendency towards financial fragility, and complement Minsky's explanation of financial fragility which was based on the endogenous creation of instability through the reduction in risk assessments in tranquil times and the ability of banks to innovate to reduce reserve requirements and capital requirements by providing the motivations for these financial markets innovations that result from the competitive strategies crafted by the banking system.

The current trend of concentration in banking may be better understood from Chandler's explanation of the way industrial concerns expand to organize wholesale and retail distribution, competing those firms out of the

¹⁸ Two examples make this point. The well known negotiable CD, offered to business clients by First National City Bank, was developed and marketed by Walter Wriston who is said to have become head of City Bank as a result, but it was quickly offered by all commercial banks to their clients. The use of securitisation of bank assets through the creation of special purpose vehicles was pioneered by Salomon in mortgage banking after the collapse of the savings and loan banks, but was soon extended to all assets, including C and I loans and is now employed by all banks. Nonetheless, first movers usually tended to retain advantages because even though the techniques were rapidly reproducible, the human skills were not and replication usually involved the poaching of first mover bank personnel by competitors.

market, as well as production. Financial institutions have been involved in a similar process. The process Chandler outlined in his book on *Scale and Scope* (cf. Chandler: 1990, passim) shows primary industrial producers expanding to size that is sufficient to allow them to undertake the distribution functions that were previously offered by wholesalers pooling the distribution of several producers, and finally of retailers who offered similar services to a number of producers. If the firm is seen as an alternative to market organisation, then the incorporation of the various aspects of retail and wholesale markets represents the internalizing and thus the elimination of the market as the organising principle of these activities as well as the elimination of the wholesale and retail distribution firms that had organized these external markets.

A similar process occurs in financial markets as their organizational ability increases with the introduction of new information processing technology, increasing economies of both scale and scope (Cf. Chandler, 1990, conclusion). There is thus an interaction between financial institutions and industrial firms in which banks make it possible for firms to realise economies of scale and scope, while the creation of large scale firms requires the evolution and concentration of financial institutions and financial markets to a size that is sufficient to achieve similar scale economies.

It is thus the operation of the forces of competition that creates the uncertainty and risk that are a natural part of the Schumpeterian process of competitive innovation and creative destruction. As seen, the use of financial innovation in providing the financing of innovation in business also involves a decrease in transparency concerning the risks that are being borne in the system. While this is a process that is linked to new innovations, there is also a natural process of competition that brings about an increase in risk and financial fragility that is independent of the competitive process in the financial sector. These are considered in the next section.

4. Financial Fragility and Macroeconomic Instability

“The financial instability hypothesis is an alternative to the neoclassical synthesis, i.e., to today’s standard economic theory. It’s designed to explain instability as a result of the normal functioning of a capitalist economy. Instability of financial markets - the periodic crunches, squeezes, and debacles - is the observation. The theory is constructed so that financial instability is a normal functioning internally generated result of the behavior of a capitalist economy”.
(Minsky, 1978)

For Minsky the indebtedness created when firms borrow from banks to make innovative changes provides another facet of the explanation of why the environment in which both firms and banks operate is subject to change and instability. Instead of emphasising competitive innovation and uncer-

tainty, Minsky emphasises the relationship between indebtedness created by borrowing to finance innovation and uncertainty as crucial to the concept of financial fragility. As already mentioned, for Minsky, as well as for Schumpeter, debt financing is the very logic of capitalist production, and it is the prerequisite of the competitive activity to preserve dominance in an environment of change through continuous innovation¹⁹. Minsky's "Wall-Street Paradigm" develops a theory of endogenous macroeconomic instability by connecting the dynamics of debt structures and interest rates. It can easily be extended to the international context of a Global Capital Market paradigm by recognising that exchange rates are similar to debt contracts and will be directly related to interest rate differentials (Cf. Kregel, 1998 a)

4.1. Debt Structures and Financial Fragility

Minsky's analysis is based on the sustainability of cash flows generated by the borrowing that firms must do to create the assets needed for competitive innovation. Borrowing the concept of a "margin of safety" from Benjamin Graham, one of the originators of hedge fund investment, Minsky defines three balance sheet configurations: hedge, speculative and Ponzi. The asset side of a "Hedge" balance sheet produces expected cash inflows from new innovations that always exceed their financing costs and operating expenses, including dividends for shareholders on the liability side of the balance sheet, by a sufficient "margin of safety" or cushion capable of absorbing any unforeseen changes in cash inflows and outflows. If the cash or liquidity cushion covers, say, 2.33 standard deviations of the historical data on past gross operating returns, then the firm would be unable to meet its cash flow commitments on average only one time in one hundred. A company that is expected to meet its payments with 99% probability is close to what the banker considers a risk-free loan.

As the cushion of safety declines, the probability of being unable to meet cash flow commitments rises; there will be a point at which it is 99% probable that there will be some future periods in which the cushion will not be sufficient to enable the firm to meet its payment commitments. Nonetheless, the cumulative cushion over the life of the loan may be sufficient to cover them, so that the project has a positive expected net present value. The firm may need an additional extension of short-term credit on occasion to meet its cash payments, but by the end of the project the loan it will have been fully serviced. This is what Minsky calls a "specula-

¹⁹ From the above discussion, it seems safe to say that the "financial fragility" framework and the evolutionary perspective in economics share the same core assumptions, way of theorizing, and key results. It is, therefore, quite puzzling how they traveled the same roads and fought the same enemies without ever borrowing from each other or, better, without forging a "strategic theoretical alliance". Of course this is one of our main claims in the paper.

tive" financing position, for both the banker and the borrower are speculating that by the end of the project there will be enough money to repay the loan, even though there may have been shortfalls along the way. A loan officer of a bank that has good expertise in credit assessment will accept such loans²⁰.

Finally, when the cushion of safety is non-existent and there is a high probability of shortfalls in nearly every period, the firm may have to borrow additional funds just to be able to meet current commitments. This Minsky calls "Ponzi" financing, making reference to a well-known post-war pyramid investment scheme. These are companies that need to increase their borrowing just to stay in business, but to which, according to the aphorism and good credit assessment, bankers should not lend under any circumstances (Cf. Kregel, 1997c)²¹.

Building on the analysis of both Keynes and Schumpeter Minsky notes that in a capitalist economy in which the future cannot be predicted and is subject to unforeseen change for the reasons given in the previous sections, the value of the hedge and speculative financing positions put in place by bank lending will change with variations in the overall macro behaviour of the economy. For example, a change in economic policy that produces a rise in interest rates has two effects on firms' financing positions. First, it reduces the present values of the expected cash flows from operating the projects. Second, it increases the cash flow commitments for financing charges if interest rates are set on an adjustable or rollover basis.

4.2. Financial Liberalization, Financial Innovation and Reinforced Financial Fragility

It is quite easy to extend this analysis to firms operating in a global context. For example, a firm producing outputs that require a high proportion of imported inputs, or that relies on export sales for a large proportion of its revenue, or finances production by foreign borrowing, a depreciation in the exchange rate will have the same effect on cash flow commitments as an increase in interest rates. In addition, estimated cash flows will be revised downwards if import costs rise by the full amount of any depreciation in the exchange rate, while export prices in foreign currency are reduced in an attempt to increase market share or stimulate rapid sales. For countries

²⁰ It is worth noticing that for Schumpeter the bankers were the real capitalists in Bourgeois society and that they shared with entrepreneurs what Keynes would term animal spirits(Cf. Schumpeter: 1934, chapter 3). In Minskyan terms, Schumpeterian entrepreneurs were always speculative units, and true Schumpeterian entrepreneurs should be quasi-ponzi units.

²¹ In that sense, for Ponzi units profits expectations are solely based on the resale of assets at higher prices (or, as a flow, profits would be based on the extent that the referred pyramid investment schemes are able to reproduce themselves).

operating in an open trading system these two exogenous changes usually occur together and reinforce each other since higher interest rates are often used to defend a weak currency and to stabilise a currency after devaluation. Cash cushions or margins of safety would thus have to be larger for firms operating in countries with open capital markets and uncontrolled capital flows (Cf. Kregel, 1997c and 1998a).

For some borrowers the cushions of safety will not be sufficiently large to cover exogenous changes in both interest rates and exchange rates and may be sufficient to transform them directly from "hedge" finance units into "Ponzi" finance units. The result is an overall increase in the lender's credit risk on outstanding bank loans, since the borrower's cushion of safety is now smaller. There is also an increase in borrower's risk for the firms as they find it more difficult to realise their initially expected cash flows. The *fragility* of the domestic financial system thus increases with either a rise in interest rates, or a depreciation of the currency.

Obviously, this same reasoning can be applied to domestic banks that are allowed to borrow and/or lend in international capital markets. They will require higher cushions of safety to cover the possibility of changes in international interest rates or the exchange rate. But, a bank with international operations is in an even more exposed position. A rise in interest rates and a depreciation of the exchange rate not only reduces the present value of its cash flows from domestic assets represented by the interest payments received from its outstanding domestic loans and increases the interest costs of its foreign funding, it also reduces the credit quality of its internal loans and thus reduces its own credit rating as a borrower. It will thus have to pay higher credit spreads on its domestic and international funding which it will be unable to recover through higher interest rates charged to its domestic clients. If the change in rates is sufficiently large banks may also find themselves suddenly in the condition of a Ponzi unit in which cash inflows no longer cover cash outflows, and the value of assets no longer provides cover for its liabilities for any future date. The net present value of the bank falls below zero and it becomes technically insolvent.

The natural response of a banker to such conditions would be to cut down on funding costs by reducing lending to firms that are classified as hedge and speculative units and by calling in all lending to Ponzi financing units. As noted, the special characteristics of speculative and Ponzi firms is that they need increased finance from the banks just to stay in business. But, the bankers may have no choice but to cut off support if the banks themselves have become Ponzi units; they may be forced to reduce their lending because their own funding sources refuse to roll over or extend credits. Obviously, domestic banks will also be unwilling to lend to each other, so

the domestic interbank market will also contract, leading to a generalised difficulty in completing payment of current cash commitments and a liquidity shortage. As both firms and banks attempt to reduce their foreign currency exposure, market imbalances may occur, leading to a breakdown in the foreign exchange market as well. As a result a financially fragile system may be transformed into a financially *unstable* system.

In such conditions, Ponzi financing firms have no choice but to reduce their own cash outflows, delaying current payments to suppliers, cutting back on expenditures, and by attempting to raise cash in any way possible which means by selling out inventories, and what output they can continue to produce with current inventories of inputs, at distress prices. If this is insufficient to cover cash flow needs, they will be forced to sell any other assets they may have, or to generate liquidity by suspending current investment projects or even selling capital equipment. They will also layoff or fire workers who represent a cash drain. The result, in contradiction to Say's Law of Markets, is a generalised condition of excess supply in all markets, placing downward pressure on prices of both output and assets.

Such conditions appear peculiar because generalised excess supply will also be accompanied by declining overall demand (which is usually thought to rise when prices fall) as a result of the suspension of investment expenditures by firms whose balance sheets have reached Ponzi conditions, the general decline in investment due to the tightening of monetary policy, and the fall in consumption caused by the fall in household incomes and increased unemployment. This will place additional pressure on short-term money markets, and may even push short rates upwards as credit conditions deteriorate, current payments are delayed and more financing units seek temporary financing to keep operating.

There are any number of factors which might generate the scenario just outlined. Rather than being produced by exogenous changes in economic variables that render cushions of safety insufficient to insure stable expansion, an endogenous process may lead to an underestimation of the risks associated with innovative investment plans and thus to the provision of cushions of safety that are too thin. This may occur in periods of sustained economic stability in which the weight of persistent past positive experience increases the expectation of future success, and the memories of past crises fade from the collective memories of both bankers and managers as borrowers and lenders. Alternatively, epochal Schumpeterian technological changes may generate increases in optimism concerning the profits from applying the new technology.

Whether it is a reduction in risk assessments due to extended tranquil conditions or an increase in the expectation of earnings due to the introduction

of a new technological epoch, the resulting reduction in the mathematical expectation of possible loss will lead to a reduction in the cushion of safety that had previously been thought prudent. Usually both of these processes work together, a "stable environment" is usually characterised as a period without major external shocks (Cf. Kregel, 1998 a, 1998 b) or new technology provides rapid increases in returns to first movers that are extrapolated across other industries. Thus cushions of safety are reduced along with the lowered expectations of negative shocks or the increased expectation of above average returns which soon become considered as average. Usually the external shocks are identified in terms of changes in sales or financing conditions while the new technological epochs may be the introduction of steam power, or railroads (cf. Chandler's analysis of railroads quoted above) or the recent telecommunications / e-commerce revolution.

As noted above, changes in exchange rates may have a similar impact to changes in interest rates. Thus, a period of prolonged exchange rate stability may also lead to over optimistic assessments of the stability of the domestic currency values of foreign commitments and similar reduction in margins of safety relating to foreign cash commitments or inflows. This endogenous change in margins makes the passage from a fragile to an unstable system that much more rapid in the event of an exogenous shock.

However, every period of tranquility is eventually interrupted and not every technological revolution produces a generalised increase in returns in all sectors, so that expectations are eventually disappointed and the combination of events in which rising supplies and falling prices leads to a collapse in demand (rather than demand increasing with falling price as in the traditional analysis) is what Irving Fisher called a "debt deflation" process. Minsky's extension of the process places more importance on the fact that the rising credit risks that result are reflected on bank balance sheets in the form of increased charge-offs and a general decline in asset quality which will eventually place some banks in difficulty as their capital cushion is overwhelmed by loan losses, and a full fledged financial panic is set off. This spread of fragility from the productive to the banking sector characterises the passage from financial fragility to financial instability and crisis.

Summing up, periods of sustained, stable expansion or of the rapid introduction of new technology in open capitalist economies with sophisticated financial systems will endogenously generate financial fragility as margins of safety are reduced. "*Destabilizing stability*" is a nice shortcut used by Minsky himself to frame this situation (Minsky: 1986, introduction).

In Minsky's view, capitalist economies have an inherent tendency to increasing leverage and financial vulnerability which leads sophisticated

financial systems to be biased towards financial fragility. This financial fragility framework proposed by Minsky is integrated into the competitive behaviour of banks discussed above by noting that banks are willing to increase their lending to more highly leveraged companies when creative destruction and competitive innovation or the introduction of new technologies takes place in a climate of sustained economic expansion, but to drastically revise their credit ratings on these companies when they face difficulties in meeting their interest payments due to failure of a particular innovation or of overall demand, reducing lending or even calling in loans, as soon as they *suspect* that their debtors can face solvency problems.

From a dynamic Schumpeterian point of view, and as already mentioned, this behavior can be expressed in the observation that when banks are strategizing aggressively in a stable expansion they compete for market share by increasing the volume of their lending and usually can only do this by extending facilities to more aggressive innovators which reinforces the process of endogenous change and inherent market instability as well as increasing their risk exposures and reducing their cushions of stability, and when they are strategizing conservatively they compete for liquidity and/or, for solvency, thereby driving their borrowers into more unstable balance sheet positions and increasing instability. This standard strategy of banking industry behaviour thus contributes to reinforcing financial instability whatever the strategy adopted.

Since bankers will lend against the value of the security pledged against the loan or against their expectations of the future cash flows to be generated by an innovative project their lending will be influenced by their subjective assessments of the value of the underlying security or the profitability of a project. When conditions are good and expectations are optimistic, valuations of security will be raised and more lending will take place. As George Soros (1987, p. 81) has pointed out, this process is self-reinforcing since the very act of lending by the bank may change expectations and thus the "fair" value of the collateral used to secure the loan. Lending may increase the value of the collateral and thus appear to reduce the credit risk associated with lending to the firm while it also appears to reduce the risk exposure of the bank. On the other hand, a firm that fails to attract bank loans may have to enter into distress sales or reduce activity, thereby reducing the value of its assets pledged as collateral against outstanding loans. There will thus be a tendency for the effective risk undertaken by banks to increase in expanding conditions.

Minsky's original analysis of the passage from financial fragility to financial instability is based on a change in domestic monetary policy or the persistence of stable domestic conditions. But, as seen above, the analysis is eas-

ily extended to a period of Schumpeterian technological revolution or an exogenous exchange rate shock for companies operating in open trading systems and to banks borrowing and lending in international money and capital markets. With increasingly interdependent capital markets and increased capital flows, the impact of a change in monetary policy would then have to be extended to a change in the monetary policy of the largest international lenders.

Changes in interest rates of the major international lenders, especially the US and Japan, have been especially important in creating financial instability in developing countries during the debt crises of the 1970s and 1980s, and their impact on exchange rates has been a major factor in the 1997 's Asian crisis. However, that crisis has been exacerbated by an additional element: the conditionality imposed on the borrowers seeking support from the multilateral agencies (Cf. Kregel, 1998 a, 1998 b and 1998 c, for extensions of those arguments).

As noted above, the normal scenario for a developing country financial crisis would involve domestic firms borrowing in foreign currency from foreign banks at interest rates which are reset at a short rollover period. Note that it makes little difference if the loans have a short or long maturity, the point is the change in interest costs on cash flows produced by the short reset interval for interest rates. Short reset periods mean that a rise in foreign interest rates is quickly transformed into an increased cash flow commitment for the borrower, instantly reducing margins of safety. If the change in international interest rate differentials leads to a depreciation of the domestic currency relative to the borrowed foreign currency, then the cushion of safety is further eroded by the increase in the domestic currency value of the cash commitments and the principal to be repaid at maturity.

Finally, if the government responds to the weakness of the domestic currency in international markets by increasing domestic interest rates in order to stem currency speculation or to attempt to attract foreign demand for the currency, domestic demand may be adversely affected and domestic cash flows will be reduced and domestic financing costs will be increased. Firms may thus pass rapidly from hedge financing to Ponzi finance units as the result of a rise in foreign interest rates. Whether this increase in financial fragility turns to instability and crisis will depend on the willingness of foreign banks to extend additional foreign currency lending to cover the payment shortfalls on current commitments. If foreign banks follow the bankers' aphorism, they may be unwilling to do this.

As a result, firms may be forced to attempt to improve their foreign earnings by increasing foreign sales. But, this usually leads to falling prices in international markets which compounds the losses from depreciation of the

exchange rate, and any cutback in domestic operations simply makes domestic demand conditions worse. The knock-on or contagion effect thus hits both the domestic financial system and the foreign banks, who now have increasingly dubious loans on their books. If both foreign and domestic banks' capital cushion is insufficient to absorb the losses, then fragility turns to global systemic instability. In any case, the initial shock, as well as the recommended policies, combine to increase fragility and thus make instability possible in any exchange rate crisis.

The impact of technological change on the fragility of the system can be seen in the current behaviour of financial markets where new electronic commerce companies with no earnings history and no current expectations of positive profits are funded by banks and venture capital firms in the expectation of floating the shares in an initial public offering on the stock market at substantial profit. After their public issue of stocks these companies continue to trade at substantial multiples of earnings when they have them, but many continue to report losses. However, this phenomenon is not exactly new. As happens in any technological revolution, major innovations inflict shake-ups into the business landscape. These new companies resemble the development of railroads in the last century. It is clear that there is duplication and all cannot succeed. Although there is no J. P. Morgan to oversee the consolidation process, those that are expected to be successful are taken over by already existing firms thus validating their stock market valuations. It is thus the expectation of profit from an IPO and then from a takeover that drives the valuation process, not the expectation of earnings.

Current activity in financial markets offers a case in point. A recent Lehman Brothers stock analysis of *Amazon* highlights its "weak balance sheet, poor working capital management, and massive negative operating cash flow" (summarized in *The Guardian*, June, 27, 2000). The company has more than \$ 2.1 billion of bond debt supported by 25.6 million of equity and around 20% of the company's assets consist of balance-sheet "goodwill", sums that are evaluated as the result of a company acquiring another for more than it is worth, writing off the difference against earnings. Thus, hundreds of millions of dollars of income are being used simply to service the company's enormous debt. This may be called a *Ponzi* balance sheet. From Minsky's point of view many such firms may start out as speculative units but become Ponzi units if expectations of a takeover decline. They can only avoid this fate if they become part of an already existing firm that has positive earnings and thus a speculative balance sheet. Thus any change in expectations or in monetary policy making the takeover of new profitless firms less likely will bring about abrupt changes in market valuations such as were seen in the recent fall of around 40% in the NASDAQ index.

5. Policy Perspectives on Finance and Development

"With the recognition of uncertainty as a deep attribute of real world economies the simplistic propositions of 'laissez faire' no longer hold. Economies with the financial system of modern capitalism can implode, as happened between 1929-33". (Minsky, 1996)

"What we need today is the same kind of pragmatic approach to public policy problems that Keynes offered in his own days" (Rodrick, 1997)

The historical point of reference for Schumpeter's view that the growth dynamic of the economic system depends on its financial system providing a means for the most dynamic entrepreneurs to obtain resources from the dying, static parts of the economy in a process that he called "creative destruction" was the German Kreditbank or "mixed bank". Although these joint-stock banks played an active role in financing German industrialization in the second half of the 19th century, their role remained limited until the unification of Germany in the 1870s. The Kredit banks founded at the middle of the century were weakened by the difficulties of the 1857 crisis. During the disturbed financial conditions of the war years they committed substantial sums in an effort to support the price of the shares of the companies they owned and thus tied up a larger proportion of their capital in holdings of company stocks than their normal operations would have dictated. It was during this period that the banks sought to develop the current account (kontokorrent) connections with firms that was to come to dominate the banks' business activities and to produce the idea of a "haus" bank. These banks reached the top of their power at the turn of the century and can be presumed to have exercised a great deal of influence on Schumpeter's thinking as expressed in the *Theory of Economic Development*.

Despite Schumpeter's optimistic view of the operation of the German Kreditbanks in support of dynamic economic growth, there is a widely held belief that these industrial of "mixed" banks are more unstable than banking systems in which banks are "separated" or segregated as in the US after the 1930s depression. There is some historical evidence to support this view, such as the difficulties faced by German industrial banks in the 1857 crisis, the Italian industrial banking collapse in the 1920s and difficulties faced by mixed banks throughout Europe in the 1930s as the value of their industrial holdings collapsed in the aftermath of the bankruptcy of Credit Anstalt.

The first question that must be faced in any discussion of policies to create a financial system capable of satisfying Schumpeter's view of the importance of the extension of bank credit in furthering competitive innovation is whether industrial banking is more prone to instability than other forms of organisation and whether the periodic bouts of crisis more than offset the benefits during expansion.

This may be investigated by defining a bank as a firm which funds the acquisition of its income earning assets by issuing sight deposit liabilities, earning income from the difference between the costs of deposits and the income of the assets acquired. Figuratively, this activity could be expressed as “riding the yield curve” since bank income results from taking a spread position: borrowing short and lending long in the expectation that the former will fall relative to the latter. This means that earnings will be influenced by interest rate movements that are expressed in changes in the position and shape of the yield curve. As one of us noted elsewhere:

“The archtypal commercial bank operating in a segregated system is restricted to spread positions on a small stretch of the yield curve for a particular type of asset: sight deposits against 90-day secured (real) commercial loans. Mixed banks, on the other hand, are free to play wherever they like on (or across) the curves for any asset they choose. This representation makes it obvious that the latter will be subject to greater risks of “speculative” balance sheets in Minsky’s sense because they are less certain to be able to sell assets at prices that allow them to repay their short liabilities on demand. They will also have greater risk of becoming insolvent because the value of longer maturity assets will generally be more sensitive to shifts or inversions in the yield curve as well as being traded in less liquid markets, while the returns on their assets will remain fixed (or may fall if asset prices or dividends fall) when short-term funds have to be replaced at higher costs. Mixed banks bear additional interest rate and price risk, will have more volatile earnings, and higher risk of illiquidity and insolvency (cf. Kregel, 1995).

The most obvious remedy for the instability caused by the spread positions taken by banks in a unified system is to limit their operations to the short end of the yield curves for particular, low risk assets, leaving the rest of the curve (and all the rest of the asset structure) to investment banks who are free to accept the additional risk, but only with their own capital, not the funds of risk-averse depositors. This remedy recalls the “real bills” doctrine, the Chicago proposals for 100% reserve banking advanced by Henry Simons, Frederich von Hayek and Milton Friedman, as well as the recently popular proposals (cf. Litan, 1987, Pierce, 1991) in the US for “core” banks limited to investing depositor funds in “risk free” government securities. All of these proposals rest on the idea that a low risk commercial bank providing transactions services to the public can be separated from high risk investment banks, who would continue to carry on the investment functions of “mixed” banks, but without placing short-term deposit funds at risk.

Thus, policy should act to segregate the financing function of banks from the provision of safekeeping and transactions services in order to ensure financial stability and the full financing of innovative competitive activity.

The only problem with the logic behind this argument is that investment banks in the US have shown no revealed preference for risk and do not generally play the entire yield curve and spectrum of available assets. Further, banks in the UK, which are not subject to any special regulations on their activities, behave as if they were subject to segregation, limiting their activity to short term lending. Experience suggests that investment banks in segregated systems have not taken over the Schumpeterian role of investment financing. Rather, investment banks in the US have tended to use their capital for short-term trading of new and existing capital assets as dealers or market-makers in the longer segment of the yield curve forbidden to commercial banks.

But, by making capital markets more liquid markets, they reduce the liquidity risk of holding long-term assets which is born in segregated systems by the final holders, the general public; by taking very short-term positions in long-term assets they are also able to avoid most of the price and interest rate risk associated with such assets. Investment banks in a segregated system tend to be traders, rather than risk-taking long-term investors. The role of investment banks in segregated systems has thus not been the provision of long-term finance, but rather to organise liquid capital markets by intermediating between the long-term holders of assets and long-term borrowers. In doing this, they do commit their own capital, but the majority of their transactions are financed by borrowing, usually from commercial banks who have always been free to lend against securities collateral, for example in the call money market.

The “separation” that occurs in such policy segregated systems is not in fact between risk-averse commercial banks making short-term business loans and risk-loving investment banks committing their own capital long term, but between banks (both commercial banks as lenders to the investment banks and the investment banks as dealers) who reduce one class of risk by acting as market makers, while households bear the price risks of providing long-term investment finance. The more efficient the banks are in reducing liquidity risk, the more willing households will be to accept price risks and the greater the amount of direct capital market intermediation through the financial markets.

From the point of view of the economic system this may reduce overall risk because it is spread over a larger base (there are more households than investment banks). As households are generally limited to lower leverage in financing their asset holdings than financial institutions, they are less likely to be subject to insolvency as a result of price risk. This is what might be classified as a “market” based system. But, the important characterising feature is the distribution of risks across types of banks and households,

rather than the method of intermediation via banks or the market. The policy conclusion is then that intervention to separate banks activities does not create a class of banks that provides investment finance, but instead has been associated with the creation of increased capital market liquidity that has shifted a key component of risk off bank balance sheets to private households.

This raises the question of why mixed banks manage their capital investment activities differently from investment banks in a segmented system, and appear to be willing to undertake the additional price risks of direct investment in long-term assets. In theory, the additional risks identified in mixed-bank systems should produce a tendency for bank organisational form to converge to the lower risk system, either through direct governmental regulation or the operation of the law of natural selection. Yet, mixed-bank systems have persisted over long periods and, in the case of Germany, have even survived periods of deep financial crisis. Indeed, EU legislation now makes universal banking the standard banking form. This suggests that either the perception of additional risk in such banks is mistaken, or that they have evolved natural protection systems and alternative methods of reducing risks. The question that has to be answered in this regard is how mixed banks have managed to avoid the price risks associated with financing their investments in long-term capital assets.

The instability of the German system in the inter-war period would appear to conform to the presumption of the inherent instability associated with mixed banking. It does not, however, support the belief that such banks provide a substitute for the capital market. The operation of German mixed banks was closely linked to the existence of an active stock market and as seen above they operated as “traders”, but of start up companies and on a slightly longer term than was typical of US investment banks. Their activities were thus very similar to venture capitalists in a segregated system, seeking good new prospects and taking an active interest in their management until they can be floated on the stock market in an IPO.

The answer to this paradox can be found in the content of German bank law (cf. Kregel 1992 c, 1995). While it does not restrict banks to the types of business they can engage in (although there are some restricted areas), it does place constraints on the composition of bank balance sheets. These take the form of “Principles Concerning the Capital Resources and Liquidity of Credit Institutions”. The most basic of these is the ‘*liquidity principle*’ (Principle II), which limits long-term lending to long-term funding, defined as the bank’s own equity plus sale of bank bonds, long-term borrowing, 60% of savings deposits and 10% of current accounts and time deposits of non-financial entities. Thus, instead of segregating the financial system, German

legislation segregated the individual bank's balance sheet into short and long term activities, with maturity matching in each section.²²

In simple terms the regulations imposed on German banks since the 1930s crisis have produced the logical equivalent of the separation of commercial and investment banks by imposing asset separation within the balance sheet of a single "mixed" bank. A German bank is required to match assets and liabilities within particular segments of the yield curve. Reduction in liquidity risk for banks holding long-term capital assets is achieved by imposed a rough matching of maturities in the long and short segments. However, such regulation does not necessarily eliminate price risk. Price risk would only be eliminated if banks matched the particular payment and return characteristics of assets and liabilities, using fixed-interest borrowing to fund fixed-interest lending of the same terms; and the sale of bank equity to investors to match bank investment in the equity of non-financial firms.

In this respect it is interesting to note that in the German system fixed-interest term lending has replaced venture capital type lending of 19th century Kredit banks, and their reliance on the equity market has all but disappeared in the post-war period. Clearly a major shift occurred in the system after the war.

²² In addition (Principle III) the bank's portfolio of loans, advances, discounted bills, quoted shares and liabilities of other credit institutions cannot exceed 60% of current and time deposits of non-financial entities, 35% of the current and time deposits held by financial entities, 20% of savings deposits, 35% of borrowing with a maturity from one month to four years and 80% of the bank's issue of acceptances, notes, bills drawn on itself and international letters of credit. Principle I requires bank capital (including reserves and retained earnings) to a minimum of 1/18th of total lending to firms, individuals and its book credits and non-controlling interests. In 1990 this list was extended to include risk adjusted off balance sheet exposures for financial swaps, forward contracts and option rights. Principle Ia limits a bank's outstanding acceptances, promissory notes and bills drawn on debtors to a maximum of 1.5 times its own capital, calculated as reported on a daily basis. In 1990 Ia "was amended more substantially to limit all 'price risks', - including in particular those arising from off balance sheet financial instruments - to 60% of a bank's liable capital" (Bundesbank, 1990, p. 39). Within this 60% limit there are individually binding class limits of 30% for foreign currency and precious metal risks, 20% for interest rate risks from interest rate forward contracts and options, and 10% of other forwards and options on shares and index-linked contracts. As a result of the spread of new financial product innovations Principle I was "extended to constitute a general counterparty risk principle going beyond mere credit risk. Principle Ia ... provide(s) a general set of rules aimed at containing ... the price risks involved in certain types of transactions which are particularly risk-prone because they require little or no capital input (leverage effect)." Further, there are regulations on the size of loans: single loans cannot exceed 75% (reduced to 50% in 1985) of the bank's own capital; the five largest loans cannot exceed three times own capital (abolished in 1985) and all large loans cannot exceed eight times loan capital. These large loans, defined as those which exceed 15% of bank capital, have to be reported without delay to the Bundesbank, and all loans above DM 1 million also have to be reported. "The main duty of the recording centre is to ascertain the indebtedness of borrowers who have obtained credits of or exceeding DM 1 million from two or more institutions, and to inform the lending institutions regarding the amount of their borrowers' total credit indebtedness and the number of lenders." (Bundesbank Annual Report, 1962, p. 95). This has now been raised to 3 million.

First, even in the absence of any change in regulation, just as firms eventually outgrew the ability of their "hausbanks" to finance them, banks could never expand their equity sufficiently rapidly to provide sufficient equity capital for investment in the industrial sector. If the use of pure equity finance had become dominant, then the German banks would either have become massive mutual investment funds or in the absence of the possibility of raising unlimited capital they would have become predominantly market makers in securities, rather than long-term lenders. In the event the war and the currency reform had the effect of virtually wiping out both the existing supply of government and private securities, eliminating the secondary capital market; the financing of new investment was primarily through retained earnings and short-term bank borrowing.

This situation required a sharp change in the methods of operation of the large banks. First, it meant that the banks could not finance and underwrite the issue of share capital in the formation of new firms because there was no capital market in which to float the shares once the companies were launched. Thus, the Schumpeterian activity of German banks effectively came to an end with the 1930s recession and the subsequent war made it impossible for them to recover their initial activities. It also meant that the mechanism by which the banks financed companies whose shares would then be floated in the securities markets could no longer be completed since there was no capital market to absorb the new issues.

As the recovery strengthened, the banks thus continued to accumulate demand and time deposits and the short-term loans to firms were rolled over into medium and long-term loans (the ratio of short to medium-long lending was split about evenly in 1954), since they could not be repaid by floating securities in capital markets. The banks were thus faced with an ever increasing maturity mismatch. This method of financing reconstruction, in the absence of capital markets, thus recreated instability because deposits could be withdrawn at any time, creating a liquidity crisis, and any change in yield differentials, such as might be caused by inflation, might cause insolvency if short rates had to be increased rapidly to retain deposits while long term lending rates remained fixed.

The former was a threat for the smaller banks, but for the larger banks with extensive branches the threat of a deposit drain was small. The inflation threat applied to all banks. There was an additional threat due to a loss in deposits from a drain of deposits abroad, but this possibility was eliminated by the existence of controls on both trade and financial flows. There were a number of policy initiatives to attempt to revive the capital market, none of which had any impact.

In order to meet the prudential regulations in such conditions, banks issued long-term bonds, which were held within the financial sector, and then slowly started to be held by the public. In this way fixed interest liabilities matched the term lending of the banks to firms and the reliance on bond finance may be seen as a structural result of the way in which price risks are hedged in the German system and as a substitute for the pre-war use of the equity market. The German mixed bank system is thus no less dependent on capital markets to reduce risk than segmented bank systems, both require them to provide a reduction in price risks. The difference is in the type of asset, bonds or equity, which dominates capital markets and whether they are direct or intermediated.

The comparison of the German and US methods of imposing prudential segregation as a stability policy suggests that instead of referring generically to mixed banks (or universal banks as has become more common) vs commercial banks, it would be more informative to refer to balance sheet segregation and functional segregation. The fact that neither investment banks nor mixed banks are willing or able to raise sufficient equity capital to provide equity finance for the industrial sector leads to long-term financing via public equity markets in the former and reliance on bond market finance in the latter. In terms of risk, and thus instability, there seems to be little difference between the two forms of bank regulation.

This suggests that much of the policy discussion, contrasting the stability of segregated and mixed bank regulatory structures, has been misplaced. From the point of view of Schumpeterian "creative destruction" or Minskyian "endogenous financial fragility" a certain amount of evolutionary instability is necessary to allow the competitive innovation that makes the system viable. To the extent that banks and other financial institutions provide the financial resources that allow firms to appropriate resources that lead to successful innovations, they will also be financing firms whose competitive strategies are unsuccessful. Perfectly safe and stable banks would mean stagnant economic development. It thus seems clear that the major objective of policy cannot be the elimination of change and instability for this would eliminate economic development. Rather policy should be directed towards ensuring financing of innovative capital projects. The historical comparison suggests that this is not a contrast between market and bank-based financial system since Schumpeter's "ideal" German Kredit bank was in fact fully integrated in the equity market before the war and in capital markets after.

The role of policy should be to provide the appropriate integration of financial institutions and markets that prevents the kind of endemic systemic instability that causes major reversals of capital flows and changes in financial prices that lead to Minsky-Fisher debt deflations.

This will involve three major areas. The first is risk management. As seen above, the major activity of banks is risk management, not undertaking the risks of maturity mismatches. The second is the way these risks are shifted from financial institutions to other balance sheets, primarily those of the public. This process puts the emphasis on the provision of market liquidity. Households will be more willing to hold long-term assets if some of the risk of holding them is offset by the ability to sell the assets at short notice in liquid markets. In turn this liquidity depends on the activity of financial institutions serving as market makers, either directly or indirectly as a result of their own investment activities. Their ability to make markets depends on their financing, in particular on their gearing or leverage ratios. In the near financial crash of August 1998, excess leverage of a number of financial institutions meant that the liquidity in many major asset markets was determined by the trading activity of these institutions. When the excessive leverage caused them to retrench it destroyed market liquidity and produced a collapse in asset prices that bordered on a Minsky debt deflation and caused the flow of new financing of all sorts for competitive innovations by any firm, irrespective of its credit rating, to dry up completely. Thus the areas in which policy will have to act are risk management techniques of financial institutions, the way in which this risk management shifts risks to balance sheets outside the financial sector, the provision of market liquidity, and the degree of leverage of balance sheets.

At the same time, the diverse way in which Germany and the US used policy to reach broadly similar results should be seen as linked to their respective industrial structures. The question is not so much whether more market or less is more beneficial, but rather the development and support of the financial system that is most appropriate to ensuring the pursuit of knowledge-based activities in those sectors which can assure greatest per capita income growth. This will mean defending indigenous financial systems in the same way as acting to develop and protect industrial "competitive" advantage. A good recent example is the German policy of Finanzplatz Deutschland (cf Kregel, 1998d, and Dore, 2000 part III). In an increasingly integrated and globalised economic environment the challenges faced by countries seeking to better their lot will become ever more difficult and may require increased regional integration.

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